SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F21-R-45

Name: Flat Creek Lake **County**: Perkins
Legal description: T21 N, R16 E, Sec. 20 & 21
Location from nearest town: 0.5 mi. west, 10 mi. south of Lemmon, SD
Dates of present survey: June 19-21, 2012
Date last surveyed: July 10-11, 2010
Management classification: Warmwater semi-permanent

Primary Species: (game and forage)	Secondary and other species:
1. Black Bullhead	1. Channel Catfish
2. Black Crappie	2. Common Carp
3. Bluegill	3. Golden Shiner
4. Northern Pike	4.
5. Yellow Perch	5.

PHYSICAL CHARACTERISTICS

Surface Area: 203.4 acres; **Watershed:** 102,400 acres
Maximum depth: 24 feet; **Mean depth**: 7.9 feet
Lake elevation at survey (from known benchmark): One foot below full-pool

Ownership of lake and adjacent lakeshore property:

Flat Creek Lake is divided by Highway 73. Approximately 50% of the shoreline is public and the rest is in private ownership. The south west side is owned by the South Dakota Game Fish and Parks (SD GFP) and lies within the Llewellyn Johns Recreation Area. The SD GFP obtained easements in 1934 that grants pubic access around the shoreline up to 12 feet above the high water mark.

Fishing Access:

Flat Creek Lake has poor access except along Highway 73 which bisects the lake. Other shoreline areas are overgrown with thick vegetation including large areas of poison ivy. Boat access is also poor with no useable boat ramp. Some small boats can be launched off the shore on the southwest corner of the east half of the lake at a break in the shoreline vegetation.

Observations of Water Quality and Aquatic Vegetation:

Cattails and bullrush surround most of the shoreline areas on both sides of the highway. Department personnel identified no pollution problems during the 2012 survey.

Observations on conditions of structures (i.e. spillway, boat ramps and docks, roads etc)

All structures appeared to be in good condition during the 2012 lake survey.

MANAGEMENT OBJECTIVES

Objective 1. Increase walleye numbers to a gill-net CPUE for stock-length Walleye $\geq$ 10, and a PSD range of 30-60.

Objective 2. Increase and maintain a moderate to high density of Largemouth Bass with PSD range between 20 and 40.

Objective 3. Maintain a mean trap net CPUE of stock-length Bullhead ,100 and PSD between 30 and 60.

BIOLOGICAL DATA

Sampling Effort and Catch

The fish population in Flat Creek Lake was sampled with the use of one experimental gill net (45.7 m [150 f]) long and 1.8 m [6-ft] deep with six 7.6 m [25 ft] panels of bar mesh sizes: 12.7 mm [0.5-in], 19.1 mm [0.75- in], 25.4 mm [1.0-in], 31.8 mm [1.25 in], 38.1 mm [1.5-in], and 50.8 mm [2.0 in] and four modified fyke (trap) nets with a 1.3-X 1.5-m frame, 19.1-mm (0.75-inch) mesh and a 1.2- X 23-m (3.9- X 75.5-ft) lead. Total effort was over night totaling one gill net night and four trap net nights on June 19-21, 2012 (Table 1 and 2). Discussion on selected fish species follows and completes this report.

Table 1. Species, number collected (N), catch per unit effort (CPUE), catch per net night of stock-length fish (CPUE-S), proportional stock density (PSD), proportional stock density of preferred-length fish (PSD-P) and relative weigh of stock length and greater fish (*Wr* ≥ S) from all species collected in modified fyke nets in Flat Creek Lake, Perkins County, South Dakota, 2012. CPUE values with 80% confidence intervals in parentheses. PSD, PSD-P and *Wr* ≥ S values with 90% confidence intervals in parentheses.

Species	N	CPUE	CPUE-S	PSD	PSD-P	*Wr* ≥ S
Black Bullhead	171	42.8 (46.9)	19.5 (20.7)	8 (5)	1 (2)	79.7 (1.1)
Channel Catfish	1	0.3 (0.4)	0.3 (0.4)	--	--	85.6 (--)
Common Carp	22	5.5 (3.4)	0.0 (na)	0	0	--
Northern Pike	4	1.0 (1.2)	1.0 (1.2)	--	--	91.2 (2.3)
Walleye	14	3.5 (2.9)	2.8 (2.2)	27 (25)	0	75.1 (5.1)
Yellow Perch	7	1.8 (1.0)	1.8 (1.0)	0	0	86.9 (4.8)
Total	219					

Table 2. Species, number collected (N), catch per unit effort (CPUE), catch per net night of stock-length fish (CPUE-S), proportional stock density (PSD), proportional stock density of preferred-length fish (PSD-P)and relative weigh of stock length and greater fish (*Wr* ≥ S) from all species collected in a experimental gill net in Flat Creek Lake, Perkins County, South Dakota, June 20, 2012. CPUE values with 80% confidence intervals in parentheses. PSD, PSD-P and *Wr* ≥ S values with 90% confidence intervals in parentheses.

Species	N	CPUE	CPUE-S	PSD	PSD-P	*Wr* ≥ S
Black Bullhead	14	14.0 (--)	4.0 (--)	0	0	83.1 (1.3)
Common Carp	43	43.0 (--)	0.0 (--)	0	0	85.7 (0.5)
Northern Pike	4	4.0 (--)	4.0 (--)	--	--	101.9 (7.5)
Walleye	5	5.0 (--)	5.0 (--)	20 (43)	20 (43)	85.2 (7.2)
Yellow Perch	2	2.0 (--)	2.0 (--)	--	--	80.2 (--)
Total	68					

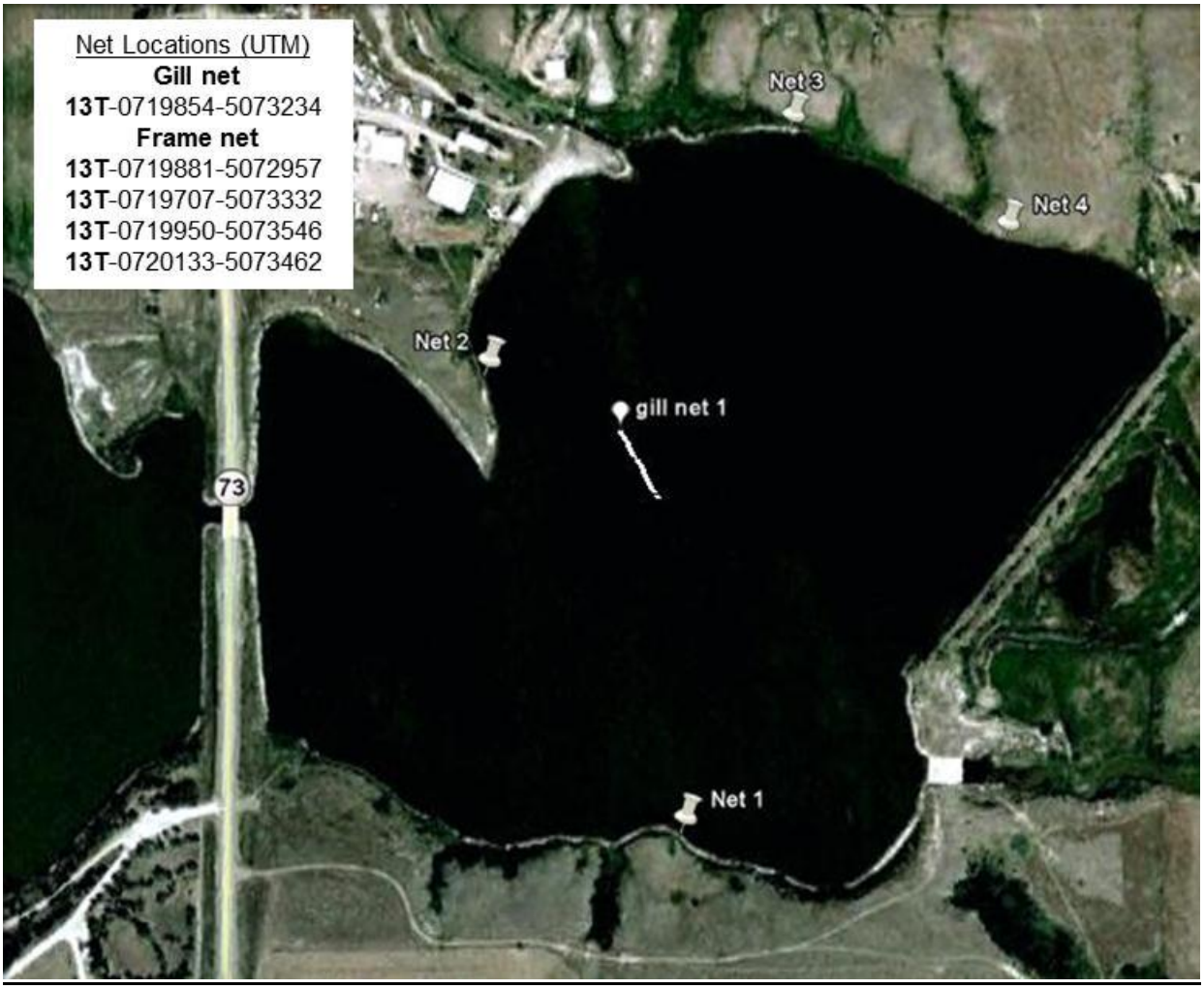

Figure 1.. Locations of the experimental gill and modified fyke (frame) nets during the fisheries survey of Flat Creek Lake, Perkins County, South Dakota, 2012.

Black Bullhead

Black Bullhead density appears to be staying within management objectives. Mean catch per unit effort (CPUE) from trap nets this survey was 42.8 with the single gill net catching 14 (Tables 1 and 2). In 2010, trap nets had a CPUE of 64.8 (Table 3). Size structure, however, remains well below objective ranges with a PSD of 8. Fish condition was also low with a Wr for stock length and larger fish of 79.7. The length frequency histogram shows these fish have grown very little since the survey in 2010 (Figure 2). To reach all management objectives, predator densities probably need to increase to help achieve better stock indices and fish condition.

Table 3. Year, catch per unit effort (CPUE), proportional stock density (PSD), proportional stock density of preferred-length fish (PSD-P) and relative weight of stock length and greater fish *Wr* ≥ S for Black Bullhead collected in modified fyke nets in Flat Creek Lake, 2000, 2003, 2005, 2010 and 2012. CPUE's with 80% confidence intervals in parentheses. PSD, PSD-P and *Wr* ≥ S with 90% confidence intervals in parentheses.

Year	CPUE	PSD	PSD-P	*Wr* ≥ S
2000	142.6 (89.0)	0	0	83.3 (0.8)
2003	112.9 (30.3)	0	0	87.6 (1.4)
2005	8.9 (5.3)	0	0	83.2 (1.4)
2010	64.8 (20.3)	0	0	--
2012	42.8 (46.9)	8 (5)	1 (2)	79.7 (1.1)

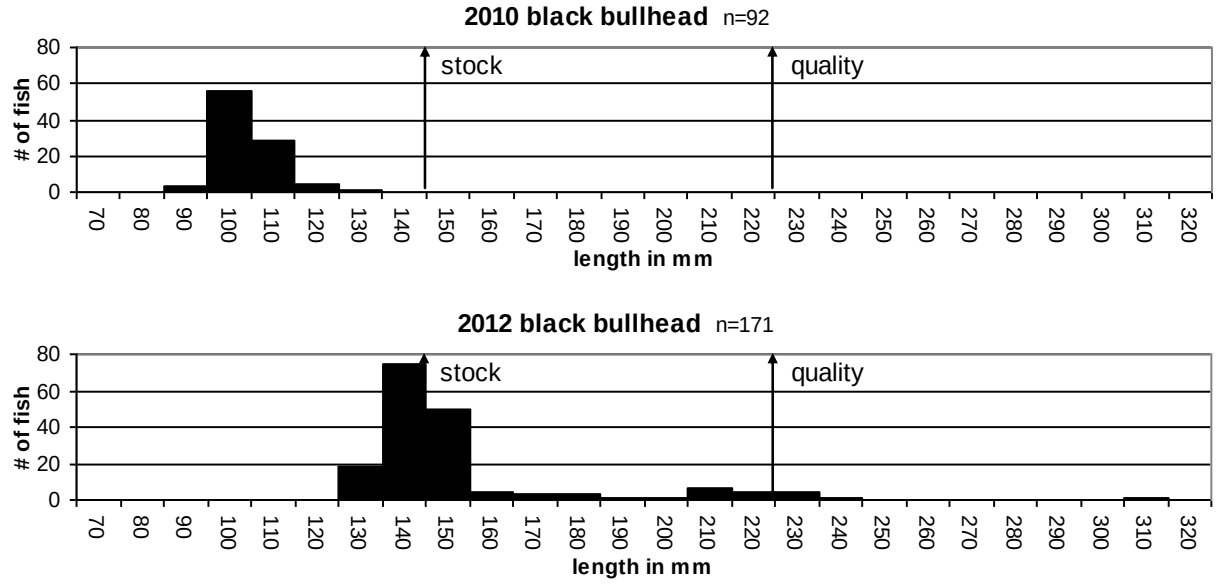

Figure 2. Length frequency histograms for Black Bullheads collected in modified fyke nets in Flat Creek Lake, Perkins County, South Dakota, 2010 and 2012.

Common Carp

The Common Carp population resembles the Black Bullhead population (i.e. a large year class of sub-stock fish). Gill net CPUE was 43 this year (Table 2), compared to 89 in 2010. No Common Carp were sampled from either gear type over stock length. The length frequency shows these fish appear slow growing, as the 2010 year class is still under stock length (Figure 3).

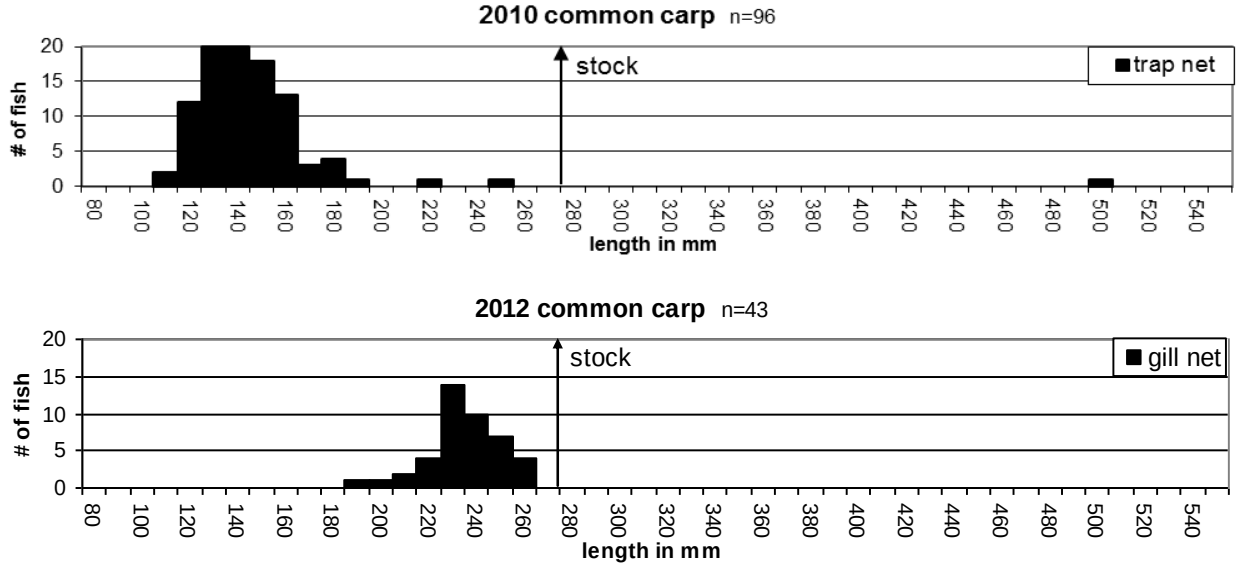

Figure 3. Length frequency histogram for Common Carp from Flat Creek Lake, Perkins County, South Dakota, 2010, 2012.

Northern pike

The Northern Pike population shows no recruitment in recent years as no fish sampled less than 630 mm (Figure 4). Catch rates indicate a low-density population, with the single gill net catching four and the four trap nets also catching a total of four Northern Pike. With the abundant forage base of Common Carp and Black Bullhead, these fish should grow rapidly and probably provide some “big fish” opportunity to the Flat Creek Lake fishery.

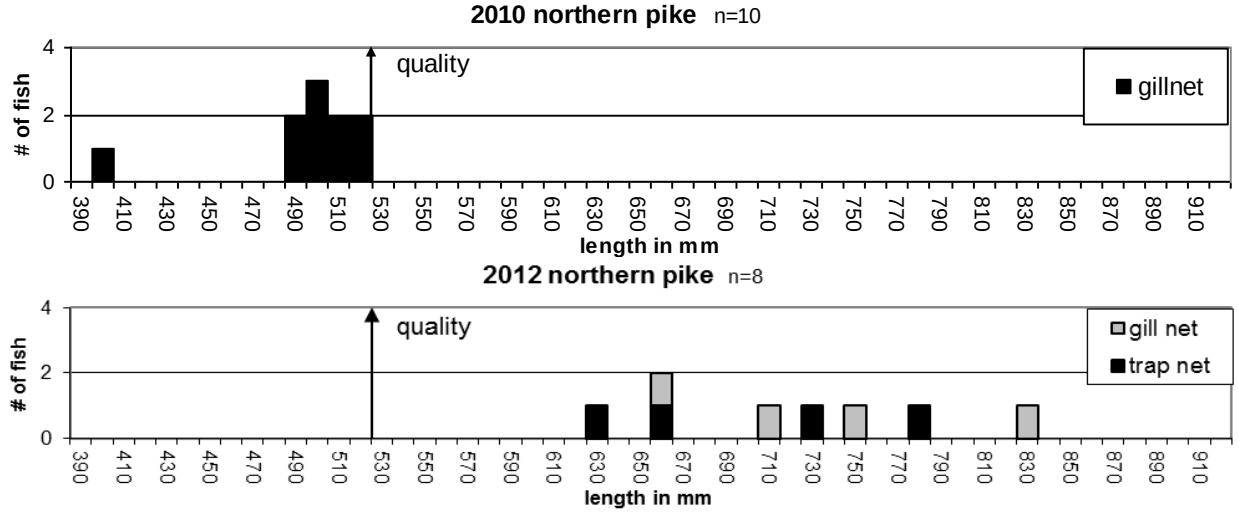

Figure 4. Length frequency histogram for Northern Pike collected in experimental gill (gill) and modified fyke (trap) nets in Flat Creek Lake, Perkins County, 2010, 2012.

Walleye

Since the low water and winterkill in 2008, 80,555 small walleye fingerlings have been stocked. In 2010, the trap net catch yielded a CPUE of 4.8, while a single gill net caught nine walleye. This survey the catch rates were 3.5 and five, respectively (Tables 1 and 2). These numbers are about half of the management objectives for gill net catch rates. Fish ranged from 220 to 540 mm (Figure 5). As these fish get larger, they should be able to forage on abundant black bullhead and carp. Stockings may need to change from fingerlings to large fall walleye fingerlings in order to reach management objectives.

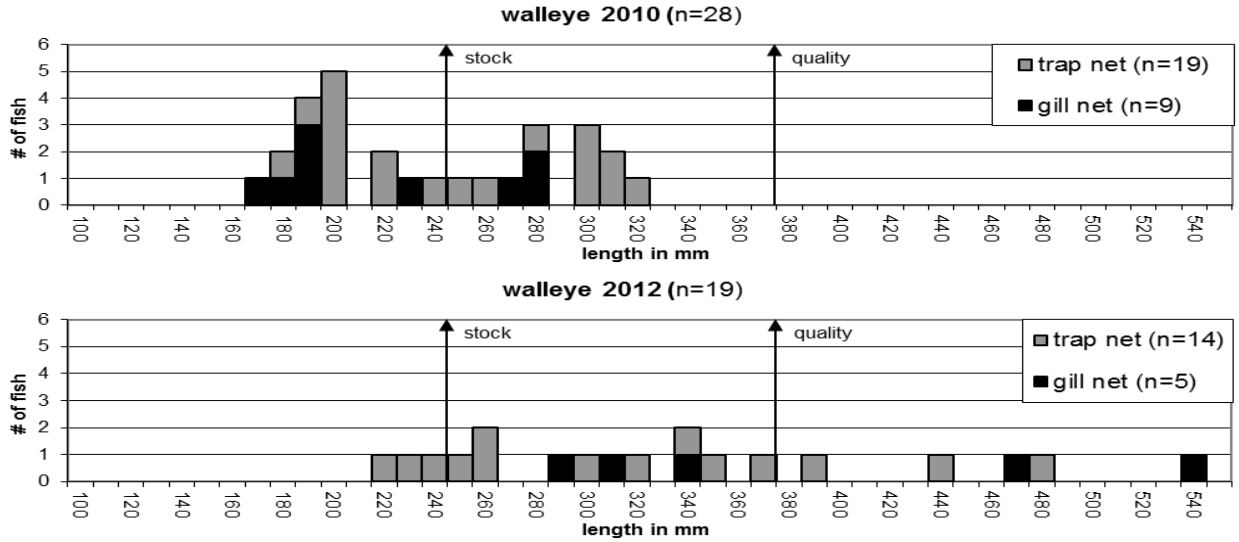

Figure 5. Length frequency histogram for Walleye collected in experimental gill (gill) and modified fyke (trap) nets in Flat Creek Lake, Perkins County, South Dakota, 2010, 2012.

RECOMMENDATIONS

1. If water levels are adequate in 2013, stock adult largemouth bass at a rate of 10 per acre to increase bass density to help reduce black bullhead numbers and improve panfish quality.

2. Stock large, fall walleye fingerlings at a rate of 10 per acre, at least every other year in order to reach management objectives and to help reduce bullhead and carp numbers.

APPENDIX

Appendix A. Stocking history, including year, number, species and size of fish for Flat Creek Lake, Perkins County, South Dakota, 2009-2012.

Year	Number	Species	Size
2009	46,625	Walleye	Fingerling
	1,000	Largemouth bass	Fingerling
2010	680	Yellow perch	Adult
	191,200	Northern pike	Fry
	20,000	Walleye	Fingerling
	1,000	Largemouth bass	Fingerling
2011	7,800	Largemouth bass	Fingerling
	30,000	Northern pike	Fry
	13,930	Walleye	Fingerling
2012	14,460	Largemouth bass	Fingerling